



UNITED STATES PATENT AND TRADEMARK OFFICE

I, John Neil Albert SWEENEY BSc, PhD, Dip. Trans. IoL,
translator to RWS Group plc, of Europa House, Marsham Way, Gerrards Cross,
Buckinghamshire, England declare;

1. That I am a citizen of the United Kingdom of Great Britain and Northern Ireland.
2. That I am well acquainted with the French and English languages.
3. That the attached is, to the best of my knowledge and belief, a true translation into the English language of the specification in French filed with the application for a patent in the U.S.A. on
under the number
4. That I believe that all statements made herein of my own knowledge are true and that all statements made on information and belief are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent application in the United States of America or any patent issuing thereon.

For and on behalf of RWS Group plc
The 6th day of December 2000

002211-00000000

COMPOSITION FOR THE PERMANENT DEFORMATION OF THE HAIR
COMPRISING AT LEAST ONE FORMAMIDINESULPHINIC ACID
DERIVATIVE

5 A subject-matter of the invention is a
composition for the permanent deformation of the hair
comprising at least one formamidinesulphinic acid
derivative. The invention is also targeted at a process
for the permanent deformation of the hair employing
10 this composition.

 The technique for bringing about the
permanent deformation of the hair consists, in a first
step, in opening the disulphide bonds of the keratin
(cystine) using a composition comprising a reducing
15 agent (reduction stage) and then, preferably after
having rinsed the hair, in reconstituting, in a second
step, the said disulphide bonds by applying an
oxidizing composition to the hair under tension
(oxidation stage, also known as setting stage), so as
20 to give the hair the desired shape. This technique
makes it possible without distinction to either wave
the hair or to straighten it.

 The compositions for carrying out the first
stage of a perming operation are generally provided in
25 the form of lotions, creams, gels or powders to be
diluted in a liquid vehicle and comprise a reducing
agent, preferably a thiol. Among the latter, those
commonly used are cysteine and thioglycolic acid and

its esters, in particular glyceryl monothioglycolate. Thioglycolic acid is particularly effective in reducing the disulphide bonds of keratin and can be regarded, at alkaline pH, in particular in the form of ammonium thioglycolate, as the reference compound in permanent waving. However, it exhibits a disadvantage of giving off an unpleasant smell. A fragrance which allows smells to be masked is generally used for the purpose of overcoming this disadvantage.

10 Cysteine has a much fainter smell than that of thioglycolic acid but the degree of curling obtained is much less and far from being satisfactory. Furthermore, cysteine requires the use of a highly alkaline pH.

15 Glyceryl monothioglycolate is also highly malodorous. In contrast, it is used at a pH close to neutrality but its performance is appreciably inferior to that of thioglycolic acid.

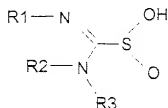
 Various studies have been carried out for the
20 purpose of overcoming the disadvantages of these reducing agents and, to this end, the use of novel reducing compounds has been proposed. Thus, Patent Application US 3 715 429 has disclosed a composition for the deformation of the hair comprising thiourea
25 dioxide in combination with an activating agent.

 Nevertheless, the reducing compositions for permanent waves known to date are still not entirely

satisfactory, given that damage to the hair fibre is excessively great.

The problem posed by the invention is to provide a reducing composition for the permanent deformation of the hair which is more effective than those which already exist, in particular in terms of degree, of liveliness or of quality of curling, while reducing the damage to the hair.

To solve this problem, the invention provides a reducing composition for the permanent deformation of the hair, characterized in that it comprises, as reducing agent, an N-substituted formamidinesulphinic acid derivative of following general formula (I):



(I)

in which:

(a) R1, R2 and R3, which are identical or different, represent a hydrogen atom, an amino, C1 to C8 amino-alkyl, imino, C1 to C8 aminoalkyl or guanidino group, a C1 to C8 linear or branched alkyl, C2 to C8 alkenyl or C7 to C20 aralkyl group, or an aromatic or nonaromatic C3 to C20 ring optionally comprising one or more heteroatom(s) chosen from halogens, nitrogen, oxygen or

sulphur; it being possible for all these substituents optionally to carry one or more hydroxyl, carboxyl, amino, amido, halogen, C1-C8 alkyl or C1-C8 alkoxy radicals, and

- 5 (b) at least one of the R1, R2 or R3 groups is an amino or C1 to C8 aminoalkyl group or is chosen from the alkyls, alkenyls, aralkyls, aryls or rings listed above in (a), these groups being, in addition, either directly substituted by at least one sulphonyl,
 10 sulphonate, phosphonyl, phosphate, amino or C1 to C8 alkoxy radical or substituted by another C1 to C8 alkyl, C2 to C8 alkenyl or C7 to C20 aralkyl group, themselves substituted by a sulphonic acid, sulphonate, phosphoric acid, phosphate, amino or C1 to C8 alkoxy
 15 radical;
 and the inorganic or organic salts of the said compounds of formula (I).

The invention also relates to the use of a compound of formula (I) as reducing agent, in
 20 particular in a reducing composition intended for the permanent deformation or the straightening of the hair.

Yet another subject-matter of the invention relates to a process for the permanent deformation of the hair employing a reducing composition comprising a
 25 least one compound of formula (I).

The R1, R2 and R3 groups chosen in order to obtain a compound of formula (I) as defined above are preferably selected from:

- the hydrogen atom,
- linear or branched C1-C6 alkyls optionally substituted by at least one hydroxyl, carboxyl, amino, sulphonyl or phosphonyl radical,
- 5 - phenyls optionally substituted by at least one halogen atom or by a C1-C4 alkyl or C1-C4 alkoxy radical or alternatively hydroxyl,
- heterocycles, such as pyridine, dihydropyridine, tetrahydropyridine or quinoline, and
- 10 - the guanidino radical.

The compounds of formula (I) are generally prepared according to the procedures disclosed in the following references:

- E. Ya. Yarovenko et al., Zh. Org. Khim. (1970), 6
- 15 (5), 947-9;
- M.F. Kondrachova et al., Metody Poluch. Khim. Reaktivov Prep. (1969), No. 20, 56-7;
- D. De Filippo et al., J. Chem. Soc. Perkin Trans. II (1972), (11), 1500-2;
- 20 - J.J. Havel et al., Synth. Commun. (1974), 4 (6), 389-93; and
- Patent Applications SU 229521 and EP-A1 488749.

Mention may in particular be made, among the preferred compounds of general formula (I), of:

- 25 - imino(methylamino)methanesulphinic acid
- imino(propylamino)methanesulphinic acid
- (dimethylamino)iminomethanesulphinic acid
- (diethylamino)iminomethanesulphinic acid

- (ethylamino) (ethylimino) methanesulphinic acid
- (methylamino) (methylimino) methanesulphinic acid
- 5 - (ethylamino) (ethylimino) methanesulphinic acid
- (butylamino) (butylimino) methanesulphinic acid
- (phenylamino) (phenylimino) methanesulphinic acid
- 10 - (phenylmethylamino) (phenylmethylimino) - methanesulphinic acid
- (carboxymethylamino) iminomethanesulphinic acid
- 15 - (2-carboxyethylamino) iminomethanesulphinic acid
- (3-carboxypropylamino) iminomethanesulphinic acid
- (5-carboxypentylamino) iminomethanesulphinic acid
- 20 - (hydroxymethylamino) iminomethanesulphinic acid
- (2-aminoethylamino) iminomethanesulphinic acid
- 25 - imino(sulphonylmethylamino) methanesulphinic acid
- imino(2-sulphonylpropylamino) methane-sulphinic acid

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- imino(2-phosphonylmethylamino)methane-
sulphinic acid
- imino(phenylamino)methanesulphinic acid
- imino(4-methylphenylamino)methanesulphinic
5 acid
- imino(4-hydroxyphenylamino)methanesulphinic
acid
- imino(4-methoxyphenylamino)methanesulphinic
acid
- imino(2-chlorophenylamino)methanesulphinic
10 acid
- imino(4-methyl-2-pyridylamino)methane-
sulphinic acid
- imino(6-methyl-2-pyridylamino)methane-
15 sulphinic acid
- imino(5-methyl-2-pyridylamino)methane-
sulphinic acid
- imino(2-quinolylamino)methanesulphinic acid
- imino(3-quinolylamino)methanesulphinic acid
- (methylimino)-2-pyridylaminomethane-
20 sulphinic acid
- (methylimino)[(3,4,5,6-tetrahydro-
2-pyridyl)amino]methanesulphinic acid
- [(aminoiminomethyl)amino]iminomethane-
25 sulphinic acid.

Preference is very particularly given to:

- (carboxymethylamino)iminomethanesulphinic acid, and
- imino(phenylamino)methanesulphinic acid.

Mention may also be made, among the derivatives corresponding to the general formula (I) which are particularly well suited to the reducing compositions according to the invention, of those disclosed in Patent JP 93 239662, filed by Fuji.

The formamidinesulphinic acid derivative of formula (I) is advantageously formulated as an aqueous lotion, at a pH of between 2 and 11 and preferably between 7 and 10.

10 In accordance with the invention, the name "formamidinesulphinic acid" is equivalent to "amino-iminomethanesulphinic acid" or "thiourea dioxide".

20 The process in accordance with the invention for the permanent deformation of the hair comprises the application of a reducing composition comprising, as reducing agent, a compound of formula (I). The hair is shaped by using mechanical means well known to a person skilled in the art, such as curlers, the reducing composition being applied before and after the means for shaping the hair and a setting composition being applied after the reducing composition, with or without an intermediate or subsequent stage of rinsing or of application of intermediate composition.

25 According to the present invention, the permanent deformation of the hair preferably consists, in a first stage, in reducing the disulphide bonds of the keratin by application, for approximately 5 to 60 min, of a reducing composition as defined above and

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then, in a second stage, in reforming the said bonds by application of an oxidizing composition or optionally by allowing atmospheric oxygen to act.

Preferably, a reducing composition as defined above is applied to wet hair wound beforehand onto rollers having a diameter of 4 to 20 mm, it being possible for the composition optionally to be applied as the hair is wound on; the reducing composition is subsequently allowed to act for a time of 5 to 60 minutes, preferably of 5 to 30 minutes, and then the hair is copiously rinsed; after which an oxidizing composition which makes it possible to reform the disulphide bonds of the keratin is applied to the wound hair for a exposure time of 2 to 10 minutes. After having removed the rollers, the hair is copiously rinsed.

The oxidizing composition is of the type commonly used and comprises, for example, as oxidizing agent, hydrogen peroxide, an alkaline bromate, a persalt, a polythionate or a mixture of alkaline bromate and of persalt. The concentration of hydrogen peroxide can vary from 1 to 20 volumes and preferably from 1 to 10, the concentration of alkaline bromate from 2 to 12% and that of persalt from 1 to 15% by weight with respect to the total weight of the oxidizing composition. The pH of the oxidizing composition is generally between 2 and 10. This

oxidation can be carried out immediately or can be delayed.

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The deformation of the hair according to the invention can also consist of a process for

5 straightening the hair, in which a reducing composition according to the invention is applied to the hair and then the hair is subjected to a mechanical deformation which makes it possible to set it in its new form by an operation in which the hair is smoothed with a wide-

10 toothed comb, with the back of a comb or with the hand. After an exposure time of 5 to 60 minutes, in particular of 5 to 30 minutes, a fresh smoothing is then carried out, then the hair is carefully rinsed and an oxidizing or setting composition as defined above is

15 applied, which composition is allowed to act for approximately 2 to 10 minutes, and then the hair is copiously rinsed.

In the perming compositions according to the invention, the reducing agent of general formula (I) is

20 generally present at a concentration of between 0.05 and 20% and preferably between 0.1 and 8% by weight with respect to the total weight of the reducing composition.

The pH of the composition is preferably

25 between 4 and 11 and more particularly between 6 and 10 and is obtained using an alkaline agent, such as, for example, aqueous ammonia, monoethanolamine, diethanolamine, triethanolamine, 1,3-propanediamine, an

alkali metal or ammonium carbonate or bicarbonate, an organic carbonate, such as guanidine carbonate, or an alkaline hydroxide, or using an acidifying agent, such as, for example, hydrochloric acid, acetic acid, lactic acid, oxalic acid or boric acid.

The reducing composition can also comprise, in combination, another known reducing agent, such as, for example, thioglycolic acid, glyceryl or glycol monothioglycolate, cysteamine and its C1-C4 acylated derivatives, such as N-acetylcysteamine or N-propionylcysteamine, cysteine, N-acetylcysteine, the N-mercaptoalkylamides of sugars, such as N-(2-mercaptoethyl)-gluconamide, β -mercaptopropionic acid and its derivatives, thiolactic acid and its esters, such as glyceryl monothioglactate, thiomalic acid, pantheteine, thioglycerol, sulphites or bisulphites of an alkali metal or alkaline earth metal, the N-(mercaptoalkyl)-O-hydroxyalkylamides disclosed in Patent Application EP 354 835 and the N-mono- or N,N-dialkylmercapto-4-butyramides disclosed in Patent Application EP 368 763, the aminomeraptoalkylamides disclosed in Patent Application EP 403 267 and the alkylamino-mercaptoalkylamides disclosed in Patent Application EP 432 000.

According to a preferred embodiment, the reducing composition also comprises a surface-active agent of nonionic, anionic, cationic or amphoteric type and mention may be made, among these, of alkyl

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sulphates, alkylbenzenesulphates, alkyl ether
sulphates, alkylsulphonates, quaternary ammonium salts,
alkyl betaines, oxyethylenated alkylphenols, fatty acid
alkanolamides, oxyethylenated fatty acid esters and
5 other nonionic surfactants of the hydroxypropyl ether
type.

When the reducing composition comprises at
least one surface-active agent, the latter is generally
present at a maximum concentration of 30% by weight and
10 preferably of between 0.5 and 10% by weight with
respect to the total weight of the reducing
composition.

With the aim of improving the cosmetic
properties of the hair or alternatively of lessening or
15 preventing their damage to them, the reducing
composition can also comprise a treating agent of
cationic, anionic, nonionic or amphoteric nature.

Mention may in particular be made, among the
particularly preferred treating agents, of those
20 disclosed in French Patents No. 2 598 613 and No.
2 470 596. Use may also be made, as treating agents, of
volatile or nonvolatile and linear or cyclic silicones
and their mixtures, polydimethylsiloxanes, quaternized
polyorganosiloxanes, such as those disclosed in French
25 Patent Application No. 2 535 730, polyorganosiloxanes
with aminoalkyl groups modified by alkoxycarbonylalkyl
groups, such as those disclosed in US Patent No.
4 749 732, polyorganosiloxanes, such as the

polydimethylsiloxane-polyoxyalkyl copolymer of the dimethicone copolyol type, a polydimethylsiloxane with stearoxy end groups (stearoxy dimethicone), a polydimethylsiloxane-dialkylammonium acetate copolymer
5 or a polydimethylsiloxane-poly(alkyl betaine) copolymer which are disclosed in British Patent No. 2 197 352, polysiloxanes organomodified by mercapto or mercapto-alkyl groups such as those disclosed in French Patent No. 1 530 369 and in European Patent Application No.
10 295 780, and silanes, such as stearoxytrimethylsilane.

The reducing composition can also comprise other treating ingredients, such as cationic polymers, such as those used in the compositions of French Patents Nos. 79.32078 (2 472 382) and 80.26421
15 (2 495 931), or cationic polymers of the ionene type, such as those used in the compositions of Luxembourgian Patent No. 83 703, basic amino acids (such as lysine or arginine) or acidic amino acids (such as glutamic acid or aspartic acid), peptides and their derivatives,
20 protein hydrolysates, waxes, swelling and penetrating agents or agents which make it possible to reinforce the effectiveness of the reducing agent, such as the SiO₂/PDMS (polydimethylsiloxane) mixture, dimethylisobornitol, urea and its derivatives, pyrrolidone,
25 N-alkylpyrrolidones, thiamorpholinone, or alkyl ethers of alkylene glycol or of dialkylene glycol, such as, for example, propylene glycol monomethyl ether, dipropylene glycol monomethyl ether, ethylene glycol

monoethyl ether and diethylene glycol monoethyl ether, C3-C6 alkanediols, such as, for example, 1,2-propanediol and 1,2-butanediol, 2-imidazolidinone and other compounds, such as fatty alcohols, lanolin derivatives, 5 active ingredients, such as panthothenic acid, agents for combating hair loss, antidandruff agents, thickeners, suspending agents, sequestering agents, opacifying agents, colorants or sunscreen agents, as well as fragrances and preservatives.

10 The reducing composition according to the invention is provided essentially in the aqueous form, in particular in the form of a thickened or non-thickened lotion, of a cream or of a gel.

15 The reducing composition according to the invention can also be of the exothermic type, that is to say of the type which gives rise to a degree of warming when applied to the hair, which is pleasing to the person who is undergoing the first stage of the perming or hair straightening.

20 The reducing composition according to the invention can also comprise a solvent, such as, for example, ethanol, propanol or isopropanol, or glycerol, at a maximum concentration of 20% with respect to the total weight of the composition.

25 The vehicle of the compositions according to the invention is preferably water or an aqueous/alcoholic solution of a lower alcohol, such as ethanol, isopropanol or butanol.

When the compositions are intended for an operation for straightening the hair, the reducing composition is preferably in the form of a thickened cream, so as to keep the hair as straight as possible.

- 5 These creams are prepared in the form of "heavy" emulsions, for example based on glyceryl stearate, on glycol stearate, on self-emulsifiable waxes or fatty alcohols.

- 10 It is also possible to use liquids or gels comprising thickening agents, such as carboxyvinyl polymers or copolymers which "stick" the hair together and keep it in the smooth position during the exposure time.

- 15 The invention also relates to a kit, in particular for the permanent deformation of the hair, comprising, in a first compartment, as reducing composition, a composition according to the invention comprising a compound of formula (I) and, in a second compartment, an oxidizing composition.

- 20 The invention may be better understood with the help of the following nonlimiting example which constitutes a preferred embodiment of the compositions according to the invention.

25 Examples

A lotion 1 in accordance with the prior art, comprising formamidinesulphinic acid as reducing agent, and a lotion 2 in accordance with the present

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invention, comprising a derivative of formula I, namely N-phenylformamidinesulphinic acid, as reducing agent, are prepared. The compositions of these two lotions are shown in Table I below.

5

Table I

	Lotion 1	Lotion 2
Formamidinesulphinic acid	0.5 M	-
N-Phenylformamidine-sulphinic acid	-	0.5 M
Diethylenetriamine-pentaacetic acid, pentasodium salt, as an aqueous solution comprising 40% a.m.	0.2 g	0.2 g
Monoethanolamine	q.s. for pH 9	q.s. for pH 9
Water	q.s. for 100 g	q.s. for 100 g

The lotion 1 or 2 is applied to locks of natural European chestnut-brown hair. Curls are formed using curlers. The lotion is allowed to act on the wound hair for 15 minutes. The combination is dried with a hairdryer for 5 minutes. The hair is rinsed with water. A conventional setting composition based on hydrogen peroxide is applied. Rinsing is again carried out. The curlers are removed.

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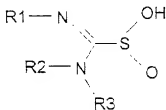
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It is observed that, with the lotion 1 in accordance with the prior art, the modification in the shape of the hair is slight, whereas the lotion 2 produces a much greater and more marked deformation in
5 the shape of the hair.

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CLAIMS

1. Reducing composition for the permanent deformation of the hair, characterized in that it comprises, as reducing agent, an N-substituted formamidinesulphinic acid derivative of following general formula (I):



(I)

10

in which:

- (a) R1, R2 and R3, which are identical or different, represent a hydrogen atom, an amino, C1 to C8 aminoalkyl, imino, C1 to C8 aminoalkyl or guanidino group, a C1 to C8 linear or branched alkyl, C2 to C8 alkenyl or C7 to C20 aralkyl group, or an aromatic or nonaromatic C3 to C20 ring optionally comprising one or more heteroatom(s) chosen from halogens, nitrogen, oxygen or sulphur; it being possible for all these substituents optionally to carry one or more hydroxyl, carboxyl, amino, amido, halogen, C1-C8 alkyl or C1-C8 alkoxy radicals, and
- (b) at least one of the R1, R2 or R3 groups is an amino or C1 to C8 aminoalkyl group or is chosen from the

alkyls, alkenyls, aralkyls, aryls or rings listed above
in (a), these groups being, in addition, either
directly substituted by at least one sulphonyl,
sulphonate, phosphonyl, phosphate, amino or C1 to C8
5 alkoxy radical or substituted by another C1 to C8
alkyl, C2 to C8 alkenyl or C7 to C20 aralkyl group,
themselves substituted by a sulphonic acid, sulphonate,
phosphoric acid, phosphate, amino or C1 to C8 alkoxy
radical;
10 and the inorganic or organic salts of the said
compounds of formula (I).

2. Composition according to Claim 1,
characterized in that the R1, R2 and R3 groups are
selected from:

- 15 - the hydrogen atom,
- linear or branched C1-C6 alkyls optionally
substituted by at least one hydroxyl, carboxyl, amino,
sulphonyl or phosphonyl radical,
- phenyls optionally substituted by at least one
20 halogen atom or by a C1-C4 alkyl or C1-C4 alkoxy
radical or alternatively hydroxyl,
- heterocycles, such as pyridine, dihydropyridine,
tetrahydropyridine or quinoline, and
- the guanidino radical.

25 3. Composition according to Claim 1,
characterized in that the compound of general formula
(I) is chosen from:

- imino(methylamino)methanesulphinic acid

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- imino(propylamino)methanesulphinic acid
- (dimethylamino)iminomethanesulphinic acid
- (diethylamino)iminomethanesulphinic acid
- (ethylamino) (ethylimino)methanesulphinic
- 5 acid
- (methylamino) (methylimino)methanesulphinic
- acid
- (ethylamino) (ethylimino)methanesulphinic
- acid
- 10 - (butylamino) (butylimino)methanesulphinic
- acid
- (phenylamino) (phenylimino)methanesulphinic
- acid
- (phenylmethylamino) (phenylmethylimino) -
- 15 methanesulphinic acid
- (carboxymethylamino) iminomethanesulphinic
- acid
- (2-carboxyethylamino) iminomethanesulphinic
- acid
- 20 - (3-carboxypropylamino) iminomethanesulphinic
- acid
- (5-carboxypentylamino) iminomethanesulphinic
- acid
- (hydroxymethylamino) iminomethanesulphinic
- 25 acid
- (2-aminoethylamino) iminomethanesulphinic
- acid

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- imino(sulphonylmethylamino)methanesulphinic acid
- imino(2-sulphonylpropylamino)methane-sulphinic acid
- 5 - imino(2-phosphonylmethylamino)methane-sulphinic acid
- imino(phenylamino)methanesulphinic acid
- imino(4-methylphenylamino)methanesulphinic acid
- 10 - imino(4-hydroxyphenylamino)methanesulphinic acid
- imino(4-methoxyphenylamino)methanesulphinic acid
- imino(2-chlorophenylamino)methanesulphinic acid
- 15 - imino(4-methyl-2-pyridylamino)methane-sulphinic acid
- imino(6-methyl-2-pyridylamino)methane-sulphinic acid
- 20 - imino(5-methyl-2-pyridylamino)methane-sulphinic acid
- imino(2-quinolylamino)methanesulphinic acid
- imino(3-quinolylamino)methanesulphinic acid
- (methylimino)-2-pyridylaminomethane-
- 25 sulphinic acid
- (methylimino)[(3,4,5,6-tetrahydro-2-pyridyl)amino]methanesulphinic acid

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- [(aminoiminomethyl)amino]iminomethanesulphinic acid.

4. Compound according to Claim 3, characterized in that the compound of general formula
5 (I) is chosen from:

- (carboxymethylamino)iminomethanesulphinic acid, and
- imino(phenylamino)methanesulphinic acid.

5. Composition according to any one of the preceding claims, characterized in that the reducing
10 agent of general formula (I) is present at a concentration of between 0.05 and 20% and preferably between 0.1 and 8% by weight with respect to the total weight of the reducing composition.

6. Composition according to any one of the
15 preceding claims, characterized in that it exhibits a pH of between 2 and 11 and preferably between 7 and 10.

7. Composition according to any one of the preceding claims, characterized in that it additionally comprises an additive chosen from another known
20 reducing agent, a surface-active agent of nonionic, anionic, cationic or amphoteric type, a treating agent of cationic, anionic, nonionic or amphoteric nature, fatty alcohols, lanolin derivatives, active
25 ingredients, such as panthothenic acid, agents for combating hair loss, antidandruff agents, thickeners, suspending agents, sequestering agents, opacifying agents, colorants, sunscreen agents, fragrances and preservatives.

8. Process for the permanent deformation of the hair, characterized in that it comprises the application of a reducing composition defined in any one of Claims 1 to 7 comprising, as reducing agent, a compound of formula (I), the hair being shaped by mechanical means and the reducing composition being applied before or after the means for shaping the hair, a setting composition additionally being applied after the reducing composition.

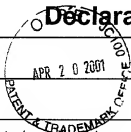
10 9. Use of a compound of formula (I) according to any one of Claims 1 to 7 as reducing agent for the permanent deformation or the straightening of the hair.

15 10. Kit comprising, in a first compartment, a composition in accordance with any one of Claims 1 to 7 as reducing composition and, in a second compartment, an oxidizing composition.

DERIVATIVE

The invention relates to a reducing composition for the permanent deformation of the hair comprising an N-substituted formamidinesulphinic acid derivative as reducing agent and to a process for the permanent deformation of the hair employing this reducing composition.

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Declaration and Power of Attorney for Patent Application**Declaration et Pouvoir pour Demande de Brevet****French Language Declaration**

En tant que l'inventeur nommé ci-après, je déclare par le présent acte que:

As a below named inventor, I hereby declare that:

Mon domicile, mon adresse postale et ma nationalité sont ceux figurant ci-dessous à côté de mon nom.

My residence, post office address and citizenship are as stated next to my name.

Je crois être le premier inventeur original et unique (si un seul nom est mentionné ci-dessous), ou l'un des premiers co-inventeurs originaux (si plusieurs noms sont mentionnés ci-dessous) de l'objet revendiqué, pour lequel une demande de brevet a été déposée concernant l'invention intitulée

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

COMPOSITIONS DE DEFORMATION PERMANENTE DES CHEVEUX CONTENANT AU MOINS UN DERIVE DE L'ACIDE FORMAMIDINE SULFINIQUE

COMPOSITIONS AND METHODS FOR THE PERMANENT DEFORMATION OF KERATIN FIBERS CONTAINING AT LEAST ONE DERIVATIVE OF FORMAMIDINE SULFINIC ACID

et dont la description est fournie ci-joint à moins que la case suivante n'ait été cochée:

the specification of which is attached hereto unless the following box is checked:

☒ a été déposée le 17 Novembre 2000 sous le numéro de demande des Etats-Unis ou le numéro de demande international PCT _____ et modifiée _____ (les cas échéant).

☒ was filed on November 17, 2000 as United States Application Number or PCT International Application Number _____ and was amended on _____ (if applicable).

Je déclare par le présent acte avoir passé en revue et compris le contenu de la description ci-dessus, revendications comprises, telles que modifiées par toute modification dont il aura été fait référence ci-dessus.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above

Je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

French Language Declaration	
<p>Je revendique par le présent acte avoir la priorité étrangère, en vertu du Titre 35, § 119(a)-(d) ou § 365(b) du Code des Etats-Unis, sur toute demande étrangère de brevet ou certificat d'inventeur ou, en vertu du Titre 35, § 365(a) du même Code, sur toute demande internationale PCT désignant au moins un pays autre que les Etats-Unis et figurant ci-dessous et, en cochant la case, j'ai aussi indiqué ci-dessous toute demande étrangère de brevet, tout certificat d'inventeur ou toute demande internationale PCT ayant une date de dépôt précédant celle de la demande à propos de laquelle une priorité est revendiquée.</p>	<p>I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International Application which designated at least one country other than the United States, listed below, and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.</p>
<p>Prior foreign application(s) Demande(s) de brevet antérieure(s)</p> <p>(Number) (Country) (Numéro) (Pays)</p> <p>(Number) (Country) (Numéro) (Pays)</p>	<p>Priority Not Claimed <u>Droit de priorité non revendiqué</u></p> <p>(Day/Month/Year Filed) <input type="checkbox"/> (Jour/Mois/Anné de dépôt)</p> <p>(Day/Month/Year Filed) <input type="checkbox"/> (Jour/Mois/Anné de dépôt)</p>
<p>Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 119(e) du Code des Etats-Unis, de toute demande de brevet provisoire effectuée aux Etats-Unis et figurant ci-dessous.</p> <p>(Application No.) (Filing Date) (N° de demande) (Date de dépôt)</p> <p>(Application No.) (Filing Date) (N° de demande) (Date de dépôt)</p>	<p>I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.</p>
<p>Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 120 du Code des Etats-Unis, de toute demande de brevet effectuée aux Etats-Unis, ou en vertu du Titre 35, § 365(c) du même Code, de toute demande internationale PCT désignant les Etats-Unis et figurant ci-dessous et, dans la mesure où l'objet de chacune des revendications de cette demande de brevet n'est pas divulgué dans la demande antérieure américaine ou internationale PCT, en vertu des dispositions du premier paragraphe du Titre 35, § 112 du Code des Etats-Unis, je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations, dont laquelle est devenue disponible entre la date de dépôt de la demande antérieure, et la date de dépôt de la demande nationale ou internationale PCT de la présente demande:</p> <p>(Application No.) (Filing Date) (N° de demande) (Date de dépôt)</p> <p>(Application No.) (Filing Date) (N° de demande) (Date de dépôt)</p>	<p>I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International Application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International Application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose any or all information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.</p> <p>(Status) (patented, pending, abandoned) (Status) (breveté, en cours d'examen, abandonné)</p> <p>(Status) (patented, pending, abandoned) (Status) (breveté, en cours d'examen, abandonné)</p>
<p>Je déclare par le présent acte que toute déclaration ci-incluse est, à ma connaissance, véridique et que toute déclaration formulée à partir de renseignements ou de suppositions est tenue pour véridique; et de plus, que toutes ces déclarations ont été formulées en sachant que toute fausse déclaration volontaire ou son équivalent est passible d'une amende ou d'une incarcération, ou des deux, en vertu de la Section 1001 du Titre 18 du Code des Etats-Unis, et que de telles déclarations volontairement fausses risquent de compromettre la validité de la demande de brevet ou du brevet délivré à partir de celle-ci.</p>	<p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.</p>

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POUVOIRS: En tant que l'inventeur cité, je désigne par la présente l'(les) avocat(s) et/ou agent(s) suivant(s) pour qu'ils poursuive(nt) la procédure de cette demande de brevet et traite(nt) toute affaire s'y rapportant avec L'Office des brevets et des marques: (<i>mentionner le nom et le numéro d'enregistrement.</i>)	POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this patent application and transact all business in the Patent and Trademark Office connected therewith: (<i>list name and registration number:</i>) FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P., Reg. No. 22,540; Douglas B. Henderson, Reg. No. 20,291; Ford F. Farabow, Jr., Reg. No. 20,630; Arthur S. Garrett, Reg. No. 20,338; Donald R. Dunner, Reg. No. 19,073; Brian G. Brunsvoild, Reg. No. 22,593; Tipton D. Jennings, IV, Reg. No. 20,645; Jerry D. Voight, Reg. No. 23,020; Laurence R. Heifer, Reg. No. 20,827; Kenneth E. Payne, Reg. No. 23,098; Herbert H. Mintz, Reg. No. 26,691; C. Larry O'Rourke, Reg. No. 26,014; Albert J. Santorelli, Reg. No. 22,610; Michael C. Elmer, Reg. No. 25,857; Richard H. Smith, Reg. No. 20,609; Stephen L. Peterson, Reg. No. 26,325; John M. Romary, Reg. No. 26,331; Bruce C. Zottler, Reg. No. 27,580; Dennis P. O'Reilly, Reg. No. 27,932; Allen M. Sokal, Reg. No. 26,695; Robert D. Bajefsky, Reg. No. 25,387; Richard L. Stroup, Reg. No. 28,478; David W. Hill, Reg. No. 28,220; Thomas L. Irving, Reg. No. 28,619; Charles E. Lipsey, Reg. No. 28,165; Thomas W. Winland, Reg. No. 27,605; Basil J. Lewis, Reg. No. 28,818; Martin I. Fuchs, Reg. No. 28,508; E. Robert Yochee, Reg. No. 30,120; Barry W. Graham, Reg. No. 29,924; Susan Haberman Griffin, Reg. No. 30,907; Richard B. Racine, Reg. No. 30,415; Thomas H. Jenkins, Reg. No. 30,857; Robert E. Converse, Jr., Reg. No. 27,432; Clair X. Mullen, Jr., Reg. No. 20,348; Christopher P. Foley, Reg. No. 31,354; John C. Paul, Reg. No. 30,413; Roger D. Taylor, Reg. No. 28,992; David M. Kelly, Reg. No. 30,953; Kenneth J. Meyers, Reg. No. 25,146; Carol P. Einault, Reg. No. 32,220; Walter Y. Boyd, Jr., Reg. No. 31,738; Steven M. Anzalone, Reg. No. 32,095; Jean B. Fordis, Reg. No. 32,984; Barbara C. McCurdy, Reg. No. 32,120; James K. Hammond, Reg. No. 31,964; Richard V. Burgujian, Reg. No. 31,744; J. Michael Jakes, Reg. No. 32,824; Thomas W. Banks, Reg. No. 32,719; Christopher P. Isaac, Reg. No. 32,616; Bryan C. Diner, Reg. No. 32,408; M. Paul Barker, Reg. No. 32,013; Andrew Grantham Sonu, Reg. No. 33,457; David S. Forman, Reg. No. 33,694; Vincent P. Kovalick, Reg. No. 32,887; James W. Edmondson, Reg. No. 33,871; Michael R. McGurk, Reg. No. 32,045; Joann M. Neth, Reg. No. 36,363; Gerson S. Panitch, Reg. No. 33,751; Cheryl M. Taylor, Reg. No. 33,216; Charles E. Van Horn, Reg. No. 40,266; Linda A. Wadler, Reg. No. 33,218; Jeffrey A. Berkowitz, Reg. No. 36,743; Michael R. Kelly, Reg. No. 33,921; James B. Monroe, Reg. No. 33,971; Doris Johnson Hines, Reg. No. 34,629; Allen R. Jensen, Reg. No. 28,224; Lori Ann Johnson, Reg. No. 34,498; and David A. Manspeizer, Reg. No. 37,540; ■■■ Thalia V. Warnement, Reg. No. 39,064; Michele C. Bosch, Reg. No. 40,524; Mark D. Sweet, Reg. No. 41,469; and Anthony M. Gutowski, Reg. No. 38,742.
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